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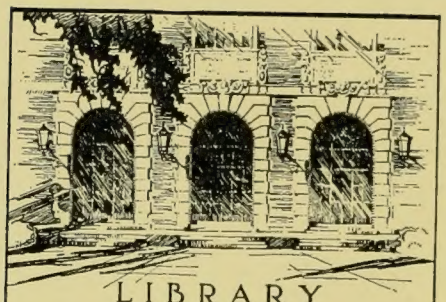

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SOME UNUSUAL NATURAL AREAS IN ILLINOIS AND A FEW OF THEIR PLANTS

ROBERT A. EVERS

Biological Notes No. 50
July, 1963

NATURAL HISTORY SURVEY DIVISION
Urbana, Illinois

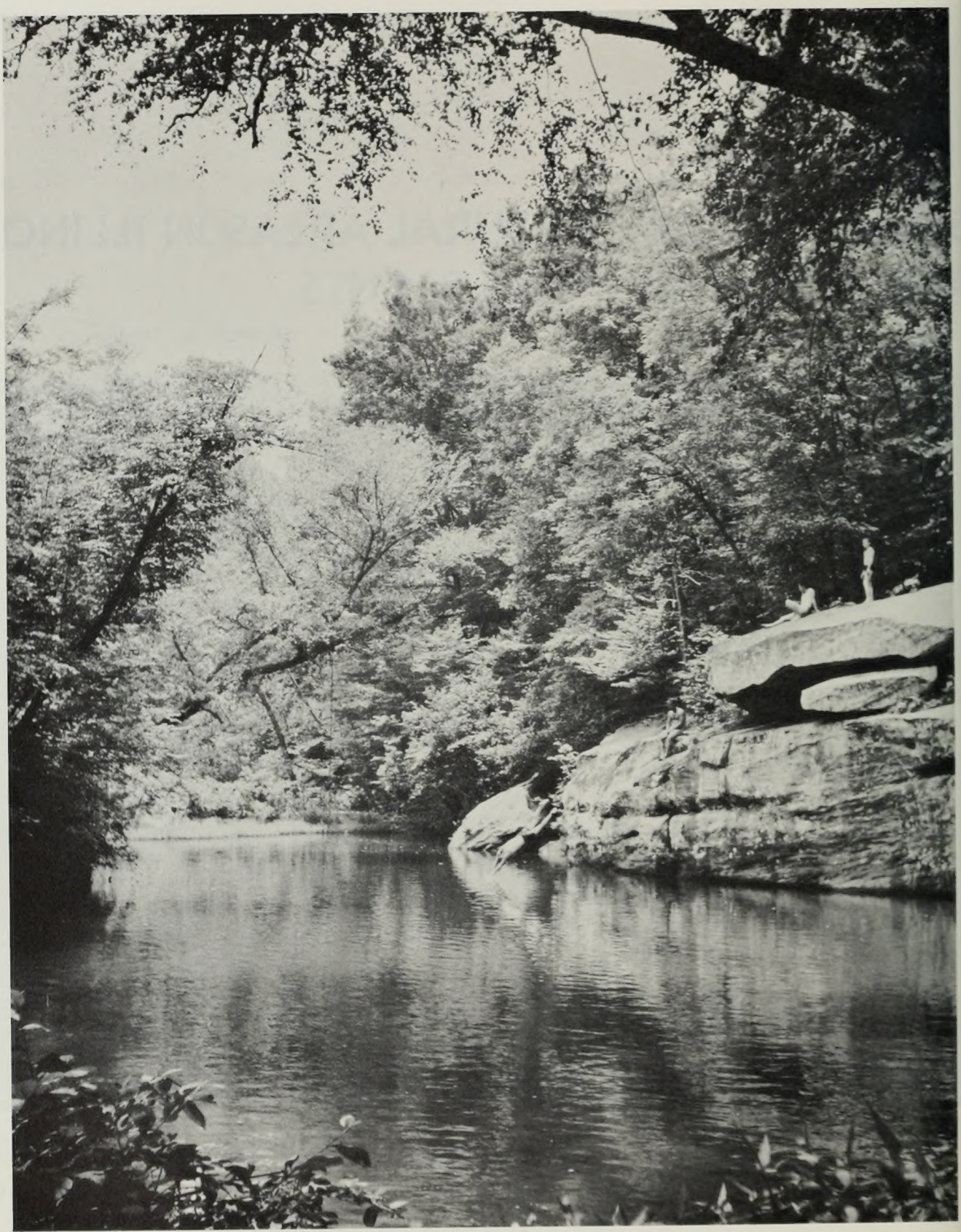

Fig. 1.-- A quiet pool in Bay Creek as it flows through the Bell Smith Springs Recreational Area.

SOME UNUSUAL NATURAL AREAS IN ILLINOIS AND A FEW OF THEIR PLANTS

ROBERT A. EVERS

This article has one main purpose: to acquaint interested persons with some unusual natural areas in Illinois. A natural area can be defined as an area of any size in which is found one or more rare species of plants or animals, an important biotic community, a significant natural landscape, or some prehistoric condition that has been scarcely, or not at all, disturbed by the activities of man. This definition permits designation of certain localities in Illinois as natural areas, although they may have been somewhat disturbed by man. Such areas can be called scientific areas as well as natural areas, because they are valuable for certain types of research.

Two centuries ago, most of what is now Illinois was scarcely touched by man. By 1900, however, our state had lost much of its forest land and most of the once vast flatland prairie. All of the big game ani-

This paper is printed by authority of the State of Illinois, Ch. 127, IRS, Par. 58.12. Dr. Robert A. Evers is Associate Botanist, Illinois Natural History Survey.

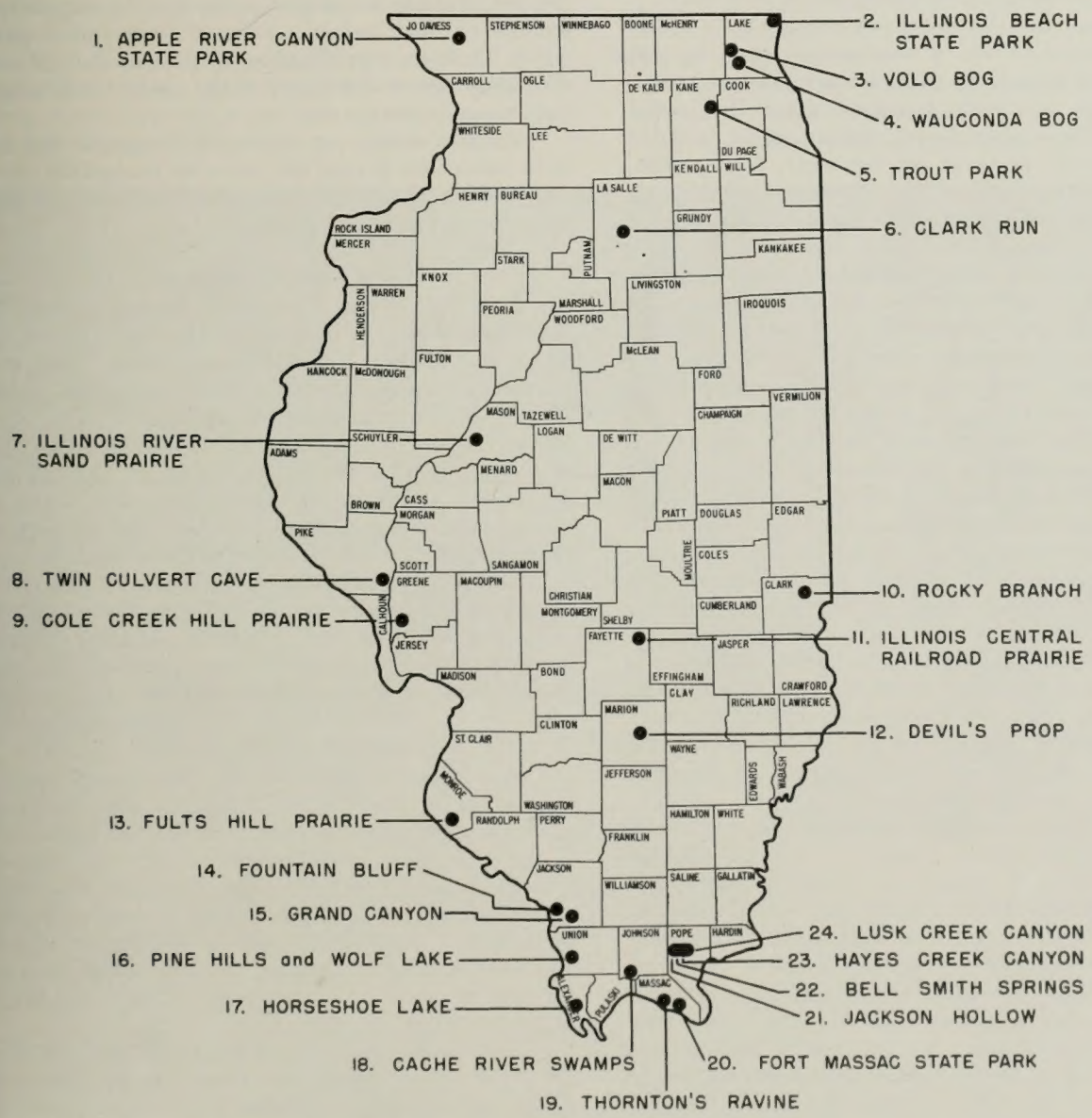

Fig. 2.-- Map of Illinois showing locations of natural or scientific areas described in this article.

mals -- buffalo, elk, cougar, and bear -- could no longer be found in the state. Deer, beaver, and turkey were gone, but they have since been reintroduced. A small area east of Rantoul was available as one of the last undisturbed flatland prairies of the state, but by 1915 it had been plowed. Illinois now has no sizable sample of the flatland prairie -- only remnants along railroads and fencerows. Not only the flatland but other types of prairie have been destroyed. The large expanses of bottomland prairie, grasslands that occupied huge areas of the floodplains of our larger streams, have been plowed and cultivated. Only fencerow remnants remain. Most of the sand prairie has been converted into fields of grain or melons or transformed into turkey farms. Prairies on the brow slopes of the valley walls of our large rivers -- hill prairies -- are the least disturbed of our prairies.

Our state and the nation are experiencing a rapid rise in population and a concomitant need for more housing and homesites, more factory sites and shopping centers, and wider highways for swifter transportation. These place heavy demands upon land. As a consequence, many of our wetlands, the swamps, marshes and bogs, refuges for rare and unusual plants and homes or resting places of numerous birds, have been or are being drained. Hill prairies near metropolitan areas are being converted into homesites. Some of our remaining forest is being cut and the land cultivated or used as homesites. We are rapidly losing an important heritage – our natural areas.

Although natural or scientific areas are ordinarily places of beauty, fig. 1, to the scientist they are much more than that. In such localities the biota -- the community of plants and animals -- lives in nearly undisturbed conditions. Here it is possible to study in natural surroundings a single species of plant or animal, or groups of plants or animals, or the relationships of both. It is in these places that the once abundant and now rare species can survive. In these refuges the biologist can study the soil flora and fauna and their relationships to other organisms, a field of study in which much remains to be done. Without these natural areas, protected from all types of "management," such researches will be impossible. To scientists and laymen, natural or scientific areas are of great importance.

In 1959, six Natural History Survey staff members (William E. Clark, Robert A. Evers, R. Weldon Larimore, Milton W. Sanderson, Philip W. Smith, and Lewis J. Stannard) who were interested in natural areas in Illinois, where they were located, and what was unique about them, became greatly concerned about our loss of scientifically important places. They suggested approximately 70 localities and from these selected 23 that they believed to be the most unusual. Most of the 23 localities are among the 24 natural areas described in this article and located in fig. 2. The others are of importance, and doubtless there are many more areas within the state that are worthy of preservation. Many of the state parks have been omitted, not because they lack natural areas but because they have been described elsewhere.

It is my hope that from this article many citizens of Illinois will become conscious of the existence of our remaining natural areas and will obtain some knowledge of them. It is my further hope that this article may arouse a desire in some persons to visit these places, not to pick the flowers or kill the wildlife, but to enjoy the genuine natural beauty. (If a natural area is in private ownership, permission to enter it should be obtained from the owner.) Many of us who are concerned about these areas hope that a sizable group of people will become interested and will help in the preservation of some or all of these localities by supporting organizations that promote the preservation of natural areas and by supporting legislation that makes adequate preservation possible. We hope that Illinois citizens of the present and future generations may enjoy natural and scientific areas in their state.

Common names are employed throughout this article except for plants that have no recognized common names. A list of the scientific equivalents for the common names is appended.

ACKNOWLEDGMENTS

I wish to thank Richard R. Graber, Milton W. Sanderson, Philip W. Smith, and Lewis J. Stannard, all of the Illinois Natural History Survey staff, for supplying certain information included in this paper. William E. Clark took the photographs used as figs. 17, 35, 36, 37, 41, 42, and 43. Wilmer D. Zehr took those used as figs. 10, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, and 40. All other photographs were taken by the author. The map that serves as fig. 2 is the work of Miss Marguerite Verley. I also wish to thank George E. Ekblaw and Jack Simon of the State Geological Survey for information on the geology of some of the localities, Harlow B. Mills, H. H. Ross, and J. Cedric Carter for the encouragement they have given, and James S. Ayars, who edited the manuscript.

1. APPLE RIVER CANYON

Apple River Canyon, about 4 miles southeast of the village of Apple River, is partly included in a state park that lies in the south half of section 4, T. 28 N., R. 4 E., in Jo Daviess County. The canyon extends beyond the park limits into the northwest quarter of section 9, the east half of section 8, the north half of section 17, and the south half of the northeast quarter of section 18. The actual area of the park is small; much more of the canyon should be purchased and preserved.

Geologically this is a most interesting locality. The valley that trends from northwest to southeast widens southeastward. Another valley, which joins it at a right angle and trends southwestward, is narrow and has high cliffs. Younger than the valley that

trends southeastward, it is the valley through which Apple River flows from this area, not into it, as would be the usual condition.

Before the advance of the Winnebago glacier, the earliest of the Wisconsinan stage (the latest stage of the ice age), Apple River flowed from the northwest to the southeast and possibly continued to the east through a valley now partly occupied by Yellow Creek in Stephenson County. Such a flow would readily explain the wider valley to the southeast. The Winnebago glacier blocked the southeast outlet and impounded the water. The impounded water cut a new channel to the southwest. This channel drained the valley from the northwest and also drained the blocked valley to the southeast. Upon deglaciation, Apple River continued to use this channel to flow southwestward and to empty into the Mississippi River.

The canyon is in a driftless area, one of the unglaciated parts of Illinois. The rocks exposed along the canyon walls are Ordovician in age, about 400 million years old.

Apple River Canyon has a vegetation of deciduous forest with northern coniferous representatives, prairie remnants, and an interesting cliff flora. Among the coniferous representatives are white pine and Canada yew. The forest contains such deciduous trees as white oak, northern red oak, Hill's oak, basswood, hop hornbeam, and rock elm. Prairie is represented mostly by remnants along the roadsides near the park and by a few remnants of the dry prairie type on the ridges. Big bluestem, little bluestem, Indian grass, and sunflowers are reminders of a more widespread prairie. The rare bird's-eye primrose grows on some of the cliffs, fig. 3. One cliff is so much adorned by this plant that it is known as "Primrose Cliff" (Pepoon 1917). This rare plant also grows on cliffs farther upstream, outside the park boundary. Studies of the plant life have been published by Boewe, Barrick, & Hague (1935) and by Fuller (1946), as well as by Pepoon.

Disturbance by visitors in the park is present but not yet acute. Some pressure on the facilities provided in this park has been removed by the open-

Fig. 3.-- Apple River and the Primrose Cliff in Apple River Canyon State Park, Jo Daviess County. In early May, the cliff is bedecked with many pinkish blossoms of bird's-eye primrose.

ing of another park -- Lake Le-Aqua-Na -- to the east in Stephenson County. Picnicking and camping are permitted at Apple River.

Apple River Canyon State Park was acquired by the state in part through the persistent efforts of Dr. Herman Pepoon, a physician who preferred to teach high school biology, rather than practice medicine, and whose interest in nature doubtless developed during his youth, which was spent in the Apple River area. He visualized a much larger park (Pepoon 1920). Perhaps we can still hope that more land to the southwest and northwest can be obtained and more, if not all, of the canyon can be placed in public ownership.

2. ILLINOIS BEACH STATE PARK

Bordering Lake Michigan between Waukegan, Illinois, and Kenosha, Wisconsin, lies a sand and gravel beach that is superimposed upon glacial till; its western limit is the Glenwood beach ridge of glacial Lake Chicago. Many writers have referred to this area as "the Waukegan moorland," but Gates (1912), who studied it in detail, called it the "Beach area."

Illinois Beach State Park occupies 1,555 acres of this sand and marsh terrace with dune ridges. The southern boundary of the park is approximately the middle of section 10, T. 45 N., R. 12 E. The eastern boundary is Lake Michigan, along which the park extends northward for 3.5 miles, to the north line of section 26, T. 36 N., R. 12 E. The northern boundary follows the north line of sections 26 and 27 westward, almost to the railroad trackway in the area. The western boundary is irregular. Part of it lies west of the trackway. Other parts, totaling 1.5 miles, coincide with the east side of the trackway. Still other parts lie east of the trackway, as much as 0.5 mile.

Fig. 4.-- The mouth of Dead River in Illinois Beach State Park. The sand and gravel bar blocks the passage of water from the river into Lake Michigan.

The geologic history of the area is complex. It includes a glacial lake known as Lake Chicago in the Lake Michigan basin. The highest level of this lake, termed the Glenwood stage, was 640 feet above sea level. Subsequent stages, the Calumet and Tolleston, were at levels respectively of 620 and 600 feet above sea level. Beaches were developed at all of these levels. Continued lowering of the lake to the present level (580 feet, mean level) resulted in the accumulation of the broad sand terrace of beach and dune ridges. The ridges of sand that border Lake Michigan were formed by currents that moved southward, not quite parallel to the present shore. Wind has reworked some of the sand deposits, but no dunes of the magnitude of those on the east shore of Lake Michigan have been formed in the Beach area, because few strong and sustained winds come from the east, the wind direction required for dune building in this locality.

The plant cover of the Beach area includes deciduous forest, prairie, marsh, a man-made coniferous forest, and the aquatic vegetation of Dead River.

The deciduous forest is represented on the dune ridges by the forest, in which black oak is dominant. White oak, bur oak, cottonwood, and quaking aspen also are present. The shrubs include lead plant, New Jersey tea, and poison ivy. Humus is not abundant in this forest.

The dune prairie is the typical sand prairie, with such grasses as little bluestem, switchgrass, Indian grass, and *Calamovilfa longifolia* var. *magna* among the common species. In the sand prairie, especially in blowouts, as well as in the forest, the creeping juniper and bearberry are abundant. These two species help stabilize the sand. Wet prairie includes such grasses as prairie cordgrass, reed grass, and sedges of the genus *Carex*. Fringed gentians flower in some of the wet prairies. Cattails are very abundant in the marshland, where bulrushes also thrive.

Dead River, a sluggish stream, drains part of this area. Its source is a few small lakes in the marshland, near the railroad trackway. The stream meanders northeastward, turns southward and southeastward, makes an abrupt turn to the north and then to the east to enter Lake Michigan. The mouth of the river is often blocked by a bar, fig. 4. In the water of Dead River can be found pondweeds, water-milfoil, and waterweeds. Elsewhere along the stream can be seen yellow pond lily and white water lily, pickerel weed, and giant bur-reed. White buttercup and common arrowhead also grow here.

The man-made coniferous forest is unique in Illinois. About a century ago, Robert Douglass, a nurseryman, scattered seeds of various species of pines on the prairie-covered ridges south of the mouth of Dead River. The seeds germinated and the pines grew. Presently some species are thriving and seeding themselves. The Austrian pine is the most abundant of them, followed by Scotch pine, fig. 5. Several

Fig. 5.-- Some of the Scotch and Austrian pines that form a part of the coniferous forest south of Dead River in Illinois Beach State Park. Prairie plants dominate the herbaceous layer.

white pines survive on the western limits of this forest, and a few trees of pitch pine are scattered in the sand just south of Dead River. A few trees of European larch grow in the interdunal troughs. Many prairie herbs still persist under the pines.

Along the shore of Lake Michigan are a few interesting associations. Beyond the range of the ordinary storm waves, sea-rocket and cocklebur are the dominant species; winged pigweed also grows here, and Russian thistle is an invading species but is not present every year. Arrowgrasses grow on the margins of beach pools.

Illinois Beach State Park is owned by the State of Illinois and is under the control and supervision of the State Park Division of the Department of Conservation. To accommodate the vast throngs of people who descend upon this place of beauty, a number of bathhouses have been constructed along the lake shore for those who wish to swim, and a lodge offers rooms and meals to guests. The area south of the lodge has been designated as a nature area. If citizens of Illinois believe that such official designation will preserve this area, I must add that there is constant pressure to convert this delightful and restful part of the park to golf courses, picnic areas, playgrounds, and similar enterprises. Citizens of Illinois must be constantly on the alert to prevent the destruction of this nature area, which has great scientific value.

3. VOLO BOG

Volo Bog, 1.5 miles north and 1 mile west of Volo, Lake County, is situated in the center of section 28, T. 45 N., R. 9 E. The bog is a water-laid peat deposit in two basins of a single depression that in earlier times formed a sizable lake on a glacial moraine. The bed is sand. The shallow basin is completely filled; the deeper basin has a pool of open water, fig. 6. Above the sand is a jelly-like ooze, and above the ooze is a deposit of sedge and sphagnum peat. Live sphagnum is growing on the surface. The depth of peat varies; in the deeper basin it is 33 feet deep. Artist (1936) made a study of the peat in this bog.

Surrounding the bog is a zone that contains canary reed grass, smartweed, and Canada thistle. A few willows, such as black willow and peach-leaved willow, grow scattered in the narrow border of the

Fig. 6.-- The pool of open water in Volo Bog, Lake County. Duckweeds grow on the surface of the water. The pool is lined with cattails.

bog and in the adjacent fields. The bog is easily viewed from the higher ground of the pastureland on the west. A plank walk, fig. 7, extends from the pasture to the open pool within the bog.

Within the narrow border is a zone of shrubs in which poison sumac and winterberry are very abundant. Such herbs as sensitive fern, cinnamon fern, and marsh fern grow in the muck of the bog surface. To venture away from the plank walk is very hazardous, as it is possible to sink deep into the muck in those places where the plant roots grow sparsely beneath the surface and do not form a dense, tight network. Farther along the plank walk, tamaracks tower above the shrubs. Near the open pool the density of the shrubs and trees decreases and herbaceous vegetation predominates.

The pool supports a heavy growth of several species of duckweeds. A zone of cattails with some giant bur-reed scattered throughout lines the shore of this pool. Numerous sedges and some bulrushes grow inland from the cattail zone. Some plants that are rare or semirare in Illinois occur in this zone. They include *Scheuchzeria palustris* var. *americana*, cotton sedge, *Dulichium arundinaceum*, *Pogonia ophioglossioides*, and the grass-pink orchid. An uncommon shrub in Illinois that thrives here is leatherleaf.

Inland from the pool and about 20 feet from the plank walk, the rare pitcher plant was once abundant. Far too many unscrupulous collectors have visited Volo and have almost destroyed the stands. Buckbean and purple cinquefoil were associated with the pitcher plant.

Part of Volo Bog, about 47 acres, is owned by the University of Illinois. The remainder is in private ownership. The bog is a well-used educational and scientific area. Many students from the University of Illinois, Northwestern University, and other universities and colleges annually visit this bog to study ecology.

4. WAUCONDA BOG

Wauconda Bog, at the southeast boundary of the village of Wauconda, is in the north half of section 36, T. 44 N., R. 9 E., Lake County. The bog covers about 67 acres.

Like Volo Bog, Wauconda was once part of a large lake of which present Bang's Lake is but a

Fig. 7.-- The plank walk near the entrance of Volo Bog. This walk permits easy access to the pool shown in fig. 6.

small remnant. If the water level of Bang's Lake should rise 8 feet, the surface of Wauconda Bog would be covered with water. Unlike Volo, no pool of open water exists within the bog; the old lake bed is filled with sphagnum and sedge peat. In the cycle of development of bogs, Wauconda is an older bog than Volo.

Wauconda can be characterized as a bog with cattails, low shrubs, and herbs alternating with tamarack, tall shrubs, stunted deciduous trees, and an herbaceous understory, fig. 8. A large stand of common reed grows near the center of the bog. Some of the tall shrubs are poison sumac, alder buckthorn, red osier, and winterberry. Some of the smaller shrubs are chokeberry, dwarf birch, and a number of species of shrubby willows. Deciduous angiospermous trees include soft maple, bur oak, quaking aspen, and basswood. Numerous sedges and grasses, among them reed grass, form much of the herbaceous cover. Growing among the grasses and sedges are other herbs, a few of which are marsh marigold, purple cinquefoil, buckbean, swamp thistle, saxifrage, and numerous asters and goldenrods. The beautiful pink ladyslipper, fig. 9, also grows here. Hummocks of sphagnum moss grow throughout, but not so abundantly as in Volo Bog.

Most of Wauconda Bog will soon be ringed by residential areas. The pastureland that once bordered

Fig. 8.-- Wauconda Bog, Lake County. At the right are shrubs and small trees. In the middle distance are a few tamaracks. A large expanse of common reed grass is visible in front of the trees on the far side of the bog.

Fig. 9.-- Pink ladyslipper, one of the rare plants of Wauconda Bog.

the bog on the south has recently been subdivided into lots and roadways. The north side of the bog touches the village. Part of Wauconda Bog is owned by the University of Illinois.

5. TROUT PARK (ELGIN BOTANICAL GARDEN)

Trout Park, also called Elgin Botanical Garden, is located in the northeast quarter of section 1, T. 41 N., R. 8 E., on the east bluffs of the Fox River in the northern part of Elgin, Kane County. The tract now embraces less than 60 acres; formerly it was larger.

"Trout Park is not a 'park' in the ordinarily accepted sense of the term. It is more than a park; it is a preserve -- a last refuge for the plant and animal life of an extensive region in these morainic hills of northern Illinois known as the 'Oak Openings' or Oak Grove Savannas because of their prevailing timber character." So wrote H. C. Benke (1932) in the Elgin *Courier-News* for March 29.

Numerous springs and seeps occur on the east bluffs, which are composed of glacial drift. The water from the springs and seeps, forming pools and brooks, makes its way downslope to the base of the bluffs and into the Fox River. These water sources apparently never run dry. The bluffs support a mesic vegetation -- plants that grow in habitats that are neither extremely wet nor extremely dry. Along the rivulets and bordering the seeps, arbor vitae grows abundantly, fig. 10. According to Benke, some individuals of this species in Trout Park are older than our nation. Willows of various species, elderberry, and touch-me-not abound in these moist situations.

The forested ravine slopes of the east bluffs support such trees as butternut, quaking aspen, large-toothed aspen, northern red oak, hackberry, blue ash, and elms. The bluff-top forest includes white oak, northern red oak, white ash, and wild black cherry.

The alternate-leaved dogwood is one of the understory trees. Numerous shrubs grow under the forest canopy. Witch hazel, several shrubby dogwoods, and viburnums are common. Trout Park is rich in an herbaceous flora that includes many species in numerous genera and families. Over 60 species of grasses thrive here. Of rare plants in the Illinois flora, this refuge boasts of six orchids and five gentians, including the bottle or closed gentian and the fringed gentian. Benke (1932) included in his *Courier-News* article published

on consecutive days three lists of the plants in Trout Park and neighboring areas.

On March 29, Benke (1932) wrote: "While owned by the City of Elgin, the park tract is under the custody of those who so earnestly labored for its acquisition -- the nature societies of Elgin, foremost among which are the Illinois Nature Study, and the Elgin Audubon Societies. These establish the rules for the park's supervision which are in turn executed by the city. This admirable arrangement guarantees the tract's preservation with nature supreme and artificialities restricted to the minimum."

Unfortunately, preservation of the tract was not guaranteed. The Illinois Toll Road, Interstate 90, now passes through what was the largest and biologically richest ravine in Trout Park. The right-of-way is about 450 feet in width and stretches in the park from the base of the bluff to the summit. The experience of Elgin proves that individuals, organizations, and local governments must be on the alert if they are to prevent the destruction of irreplaceable natural areas by "artificialities" that could be located elsewhere.

Presently Trout Park is owned by the City of Elgin.

6. CLARK RUN

Clark Run is a small stream, about 7 miles in length, northeast of Utica, La Salle County. The stream originates in section 31, T. 34 N., R. 3 E., and empties into the Illinois River near Utica. The area of botanical importance lies in the extreme north

Fig. 10.-- A path on the bluffs at Trout Park, north of Elgin, Kane County. The path leads the visitor past large arbor vitae trees, some of which are visible in the photograph.

part of section 9 and the southwest quarter of section 4, T. 33 N., R. 2 E., where the stream flows through a canyon, the walls of which are St. Peter sandstone.

The stream cascades over falls into a canyon, fig. 11, and then slowly meanders between sandstone cliffs. Marshy areas border the stream in many places

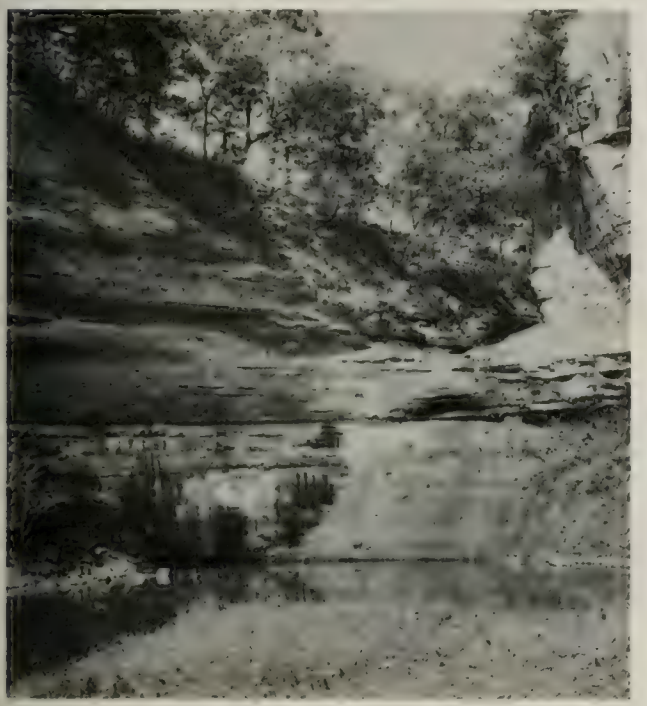

Fig. 11.— Upper part of the canyon at Clark Run. The stream enters the canyon by this route. Mallard ducks were swimming on the water of the pool below the falls on October 11, 1962, the date this picture was taken.

where the canyon cliffs have been eroded away. In these areas the skunk cabbage and marsh marigold flower in early spring. The latter occasionally blooms also in autumn. Bordering the stream are stands of blue beech, willows, and other small trees. Mayapple forms sizable clones on the relatively dry parts of the floodplain. Canada yew, arbor vitae, red cedar, and white pine grow on the cliffs. In those places where the sandstone cliffs have eroded to leave steep slopes, rattlesnake plantain, partridge berry, bunchberry, white pine (some of the trees 24 inches in diameter), and other plants can be observed. Witch hazel, saxifrage, pasture gooseberry, and false lily-of-the-valley thrive in the ravines.

Above the cliffs the conditions are more xeric, that is, the water supply is lower and the evaporation rate higher. Black oak and Hill's oak find a favorable environment in such sites. Some of the shrubs of the xeric bluff-tops are fragrant sumac, smooth sumac, and lead plant. Herbaceous plants include little bluestem, needle grass, wild indigo, and the narrow-leaved aster.

Clark Run, similar in many respects to some of the canyons of Starved Rock State Park, has not been overrun by people. Much of the canyon area and most of the adjacent uplands have been pastured, some parts severely. In spite of this treatment, some of the rare plants have survived. If cattle were removed, doubtless Clark Run would revert to a very beautiful and biologically rich area.

Clark Run is presently in private ownership.

7. ILLINOIS RIVER SAND PRAIRIES

Along the east side of the Illinois River from the big bend in Putnam County south into Scott County sizable deposits of sand form terraces upon which a dunic topography has developed. These deposits were laid down during the Wisconsinan glaciation. At that time the meltwater from the ice front with its load of sand and silt was flooding the valley of the Illinois and aggrading it. After the close of glaciation, the river cut its channel into these sand deposits, leaving the terraces. The sand terraces of the Illinois River valley supported forest, prairie, and marshland until the coming of European man. After his arrival, much of the area of sand terraces was put into cultivation -- into fields of corn, wheat, soybeans, rye, melons, or into pine plantations or turkey farms. Scattered throughout the area are small remnants of forest and prairie.

The University of Illinois owns land on the sand terrace northwest of Kilbourne, Mason County. This acreage includes both prairie and forest. The prairie lacks large dunes but possesses sizable blowouts of a compound nature. These blowouts tend to be stabilized by goat's rue, fig. 12, three species of three-awn grass, the common panic grass of sand areas, *Panicum pseudopubescens*, and the sedge *Bulbostylis capillaris*. Other sedges, *Cyperus schweinitzii* and *C. filiculmis*, grow scattered in the blowouts. Black-jack oak thrives at the border of one blowout.

Elsewhere the sand prairie contains such grasses as little bluestem, switchgrass, sand love grass, needle grass, and the tall *Calamovilfa longifolia* var. *magna*. In the interstices are such plants as goat's rue, polygala, small to moderately large patches of prickly pear, and rose mallow. A common shrub of this prairie is fragrant sumac. In one depression where the sand remains quite moist, blackberries and seed-box thrive.

It is impossible to find all the plants of the Illinois River sand prairies growing in this one locality near Kilbourne. Within a 15-mile radius, in other prairie remnants, numerous other species can be found, including two plants rare in Illinois, *Cristatella jamesii* and bladder-pod.

During the early part of this century a number of workers were occupied with studies of sand areas in Illinois. The work of Hart & Gleason (1907) is considered a biological classic. A study of the sand land vegetation by Gleason (1910) included the Illinois River sand areas. Vestal (1913) studied the relationships of plants and animals, especially the insects,

Fig. 12.-- View of a sand prairie near Kilbourne, Mason County, showing a society of goat's rue. The black-jack oak and black oak forest in the distance is second growth.

in the sand areas of the Illinois River, chiefly those near Havana.

8. TWIN CULVERT CAVE

Twin Culvert Cave is located in the middle of the southwest quarter of section 17, T. 7 S., R. 2 W., about 2 miles southwest of Pearl, Pike County. The name is taken from the two large limestone overpasses, fig. 13, that span a small stream, the bed of which at this place also forms a part of the county road to the southeast. The overpass or culvert on the south carries tracks of the Gulf Mobile and Ohio Railroad. The culvert on the north has become covered with brush. It was once part of a railroad trackway, now abandoned. The creek that flows through these culverts is small, but in periods of heavy rains it may rise 8 feet or more above the gravel stream bed. The cave is located between the two culverts, upslope on the west bank of the small stream, very close to the present railroad trackway.

The slope on which the cave is found supports a deciduous forest containing such species as hard maple, white ash, black walnut, chinquapin oak, hop hornbeam, and shingle oak growing together. Some of the common shrubs are poison ivy, wild hydrangea, bladdernut, wafer ash, and buckthorn. Wild grapes and climbing bittersweet are common vines. Of the herbaceous plants, fragile fern, clearweed, bedstraws, and violets occur very frequently.

The bluff bordering the abandoned trackway on the west side of the creek has been altered by the removal of rock, possibly for the construction of the

Fig. 13.-- Culverts constructed of local limestone near Pearl, Pike County. These culverts supply the name -- Twin Culvert Cave -- for the nearby cave. An infrequently used county road and a small stream share the culverts.

fill and the culverts. This disturbed site contains a mixture of native forest and prairie species, as well as some common weeds of European origin.

The chief objects of interest in this locality are the cave, fig. 14, and springs. Bretz & Harris (1961) described the cave as follows. "Entrance to this cave is through a roof breakdown. A network of joint-controlled vertical slots that should not be negotiated without a rope is immediately encountered. Two sets of joints cross at approximately right angles. Ceilings

Fig. 14.— Entrance to Twin Culvert Cave. Because of the nature of this cave, ropes, ladders, and ample light should be available if its exploration is attempted.

and depths appear to vary along each set." The cave is sometimes visited by a large colony of gray bats, *Myotis grisescens*, a migratory species that is poorly known and is rare in collections.

Twin Culvert Cave is presently in private ownership.

9. COLE CREEK HILL PRAIRIE

Cole Creek hill prairie is located in the northwest quarter of section 4, T. 9 N., R. 13 W., 2 miles south of Eldred, Greene County. The prairie occupies part of a bluff of the Illinois River and part of the north bluffs of Cole Creek. This locality was previously described under the name South Eldred hill prairie (Evers 1955).

The bluff of the Illinois River has a small toe slope, a limestone cliff, and a loess-covered brow slope. The bluffs of Cole Creek also have a loess cover but no visible rock outcrops. The loess was deposited during Wisconsinan time.

Vegetation characteristic of hill prairies covers about 4.5 acres of two southwest-facing slopes that form an inverted U, the prongs of the U extending downslope, fig. 15. Little bluestem is the dominant grass. Some other grasses of these slopes are big bluestem, Indian grass, side-oats grama, and Scribner's panic grass. The bluets *Houstonia nigricans* grows in this prairie, which is near the northern limit of the range of the species in Illinois. On October 1, 1958,

Fig. 15.-- One of the spurs of the hill prairie along Cole Creek, south of Eldred, Greene County. Forest with many chinquapin oaks grows in the coves.

29 stems of nodding ladies'-tresses, fig. 16, were observed in this prairie.

The toe slope, the ravine between the prongs of the U, and the bluff-tops support a deciduous forest in which common tree species are white ash, Ameri-

Fig. 16.— Nodding ladies'-tress. In 1958, 29 stems of this species were observed in Cole Creek hill prairie.

can elm, various oaks and hickories, red cedar, and Iowa crabapple. Some of the shrubs present are prickly ash and rough-leaved dogwood.

Cole Creek hill prairie is presently in private ownership.

10. ROCKY BRANCH

Rocky Branch is the name applied to a small stream in northern Clark County. This small stream, not more than 1.5 miles in length, has its source in the east half of section 30, T. 12 N., R. 12 W.; it empties into the West Fork of Big Creek in section 29 of the same township. The area of greatest interest to naturalists is more than 300 acres in extent. It centers on the small stream, on the surrounding forest, and on much of the forest on the south bank of Big Creek, including its tributary ravines. By road, the Rocky Branch natural area is 1.5 miles east and 1 mile north of Dolson (known also as Clarksville).

Rocky Branch has long been attractive to the lover of natural beauty (Stover 1930). The small stream has cut deeply into the sandstone to form a valley with steep walls and, in some places, perpendicular cliffs, fig. 17. Sizable undercuts in many of the cliff bases clearly show the eroding power of the stream when in flood. During flood stage the water in Rocky Branch may rise 8 feet above its gravel and sandstone bed, as evidenced by the debris left in trees and shrubs along the bank. Several small tributary ravines enter Rocky Branch from the south. Their streams have carved beautiful gorges in the sandstone.

The vegetation of Rocky Branch is chiefly deciduous forest. In wide parts of the valley are small plots that were once cleared of trees, maintained for

Fig. 17.-- Rocky Branch area. This view, which is from the bed of Rocky Branch, shows a cliff, the undercut formed by the stream, and the steep slope above the cliff.

a while as cultivated fields, and later abandoned. The narrow road that once traversed the valley from its head to its mouth has also been abandoned. The forest of the ravine floor is rich in plant species. Trees of this forest include sycamore, hard maple, tulip tree, beech, butternut, white ash, and hackberry. Some of the understory trees and shrubs are blue beech, wild hydrangea, elderberry, bladdernut, and spicebush. The ravine floor is a place of beauty in the spring when it is carpeted with numerous patches of colorful wild flowers. By autumn the forest floor is no longer a carpet of color, but here and there are asters, goldenrods, and white snakeroot. Among the plants of the forest floor are such ferns as the broad beech, Christmas, and grape.

Ravine slopes support vegetations that range from the xeric to the mesic. The driest slopes maintain a forest of black oak, northern red oak, shagbark hickory, and other species. Poverty grass, various mosses, and lichens are abundant on the dry soil. The moist ravine slopes sustain a forest of beech, hard maple, hop hornbeam, redbud, flowering dogwood, and other arborescent species. Beech-drops, Christmas fern, wild hydrangea, and arrowwood, as well as numerous mosses, grow on these slopes. In one locality, at the summit of a sandstone cliff, sphagnum moss is abundant. In another locality, the walking fern, hepatica, and asters grow together in patches of moss on large sandstone blocks that lie above the floodwaters of the creek.

The sandstone cliffs possess a flora of mosses and liverworts; *Conocephalum conicum* is the common species. In the recesses, wild hydrangea and several species of asters and goldenrods, as well as the maidenhair fern, find places in which they can live. Partridge berry is not uncommon at the tops of the cliffs and it grows elsewhere with mosses. Lady fern thrives in some places at the cliff bases.

The upland woods is one of oaks and hickories. The forest is dry, and the floor supports mosses, lichens, poverty grass, and other xeric species. Nodding ladies'-tresses, which blooms as late as mid-October, grows in the open parts of the upland woods.

The abandoned fields maintain a mixture of herbs and varying numbers of trees and shrubs scattered here and there. In a field abandoned in 1958, one of the few woody plants observed in 1961 was the blackberry. In older fields, smooth sumac, black walnut, tulip tree, northern red oak, and American elm have become established and perhaps are the beginnings of a deciduous forest that eventually will dominate the fields.

Rocky Branch is of interest botanically because it lies in the westernmost limit of beech, black gum, and tulip tree in central Illinois. In addition, several species of orchids grow here. According to Stover (1930), the ground pine *Lycopodium lucidulum* throve on the sandstone. Irresponsible collectors and vandals have destroyed all traces of the club moss at Rocky Branch. The absence of sizable forest trees indicates that the original forest was felled at some earlier date.

Rocky Branch is in private ownership except for 135 acres that the Nature Conservancy has recently purchased and has designated as a natural area. It has served as an outdoor laboratory for students of botany and zoology at Eastern Illinois University for more than 30 years.

11. AN ILLINOIS CENTRAL RAILROAD PRAIRIE

A little over a century ago, much of east-central Illinois was flatland prairie. Although early settlers shunned the land as being unsuitable for cultivation because of a belief that only forest soils were fertile, later ones found it was extremely productive and

Fig. 18.— Prairie remnant in railroad trackway near Watseka, Iroquois County. Such remnants are all that remain of a once great expanse of flatland prairie.

valued it highly. After a suitable plow had been perfected to break and turn the prairie sod and after drain tile had been placed to lower the water level, vast stretches of prairie were converted to farmland. Now only remnants of prairie are left; they are along roadsides or railroad trackways. These remnants, fig. 18, must be preserved if we wish any Illinois flatland prairie vegetation to remain for future generations to study and enjoy.

A prairie area located along the trackway of the Illinois Central Railroad between Laclede, Fayette County, and Alma, Marion County, is actually a series of remnants of the Twelve-Mile Prairie of south-central Illinois. Numerous stretches of this trackway have been plowed for production of farm crops or of nursery stock. Some stretches that were cultivated have been abandoned and have reverted to a prairie type of vegetation.

The area is relatively flat except for those places where small streams have eroded into the flatlands. A century ago the drainage was poor, and the flatlands between the streams were very wet except in late summer, the dry season. At that season giant cracks appeared in the clay soil. Today numerous ditches along the railroad and highway drain the land

rapidly. What effect the drainage had on the biota no one knows, as no one carefully studied these prairies a century ago.

The plants of the area are typically those of the tall grass prairie. Big bluestem, fig. 19, is the usual dominant, although switchgrass and Indian grass are locally abundant and occasionally dominant. In the wettest parts of the prairie, prairie cordgrass is the dominant plant and densely covers the ground. In places of little disturbance, the prairie is a patchwork of a few species covering sizable areas. In some sites, big bluestem covers much ground, while a short distance away may be blazing stars, rosinweed, prairie-dock, compass plant, wild hyacinth, or one of the numerous goldenrods, as *Solidago rigida.* Shrubs in the prairie include New Jersey tea and lead plant.

The seasonal aspect of the prairie is interesting to observe. In early spring the prairie is dormant and shows little activity until May, except for the flowering of a few cruciferous weeds, including Whitlow's grass. Some of the early flowers are small and rather inconspicuous, as blue-eyed grass, or small and conspicuous, as puccoon. The large and showy flowers of the beard-tongues appear in late May. In June the lead plant and the purple coneflower give a purple cast to the landscape. From then to the frosts of autumn a gradual but continual change of blossoms occurs, with the purple being replaced by yellow as the dominant color. Goldenrods and asters bloom profusely toward the close of the growing season.

Unfortunately, many people incorrectly believe the coarse prairie plants to be undesirable weeds. Within undisturbed prairie remnants very few, if any, noxious weeds – the type that cause the farmer trouble – can be found. Only after the prairie has been plowed or tremendously disturbed do the noxious weeds obtain a foothold. They then remain long after the land is no longer cultivated and they even thrive in the secondary prairie type that develops.

This prairie area between Laclede and Alma is owned by the Illinois Central Railroad. Efforts have been made by the Nature Conservancy to obtain a long-term lease for stretches, about 12 miles, of these remnants of the once vast flatland prairie.

12. DEVIL'S PROP

Devil's Prop is the local name applied to a ravine area in the northwest quarter of section 25, T. 1 S., R. 3 E., 2 miles south of Divide, a very small community in north-central Jefferson County. The ravine has been carved from the sandstone that underlies the area. At one place a pillar of sandstone appears to support the cliff, fig. 20. From this pillar, or prop, the locality received its name -- Devil's Prop.

Fig. 19.-- An expanse of big bluestem. This grass is the dominant plant in many of the flatland prairie remnants of central Illinois.

The upland to the west and northwest of the ravine has been disturbed by agricultural pursuits. Some of this land has served as pasture. On the southeast side of the ravine, a part of the upland has served as pasture and another part is a fallow field that is unpastured. In the fallow field, certain prairie plant species have persisted and are common. These include Indian grass, little bluestem, blazing star, American feverfew, goldenrods and asters. Broomsedge grows in this area. The forests of the upland contain shagbark hickory, red cedar, black-jack oak, and post oak. Poverty grass, pencil-flower, and several species of three-awn grass grow on the floor of

Fig. 20.-- Devil's Prop area. A pillar of sandstone that appears to support the cliff above supplies the name for this area near Divide, Jefferson County.

the relatively open woods. Sizable patches of mosses of several species and some lichens form patches on the soil. The orchid *Spiranthes grayi* is not uncommon in the fallow field, and a few plants grow in the woodland border.

At one place the small stream flows through a narrow, V-shaped ravine, fig. 21. In some places, the sandstone of the steep sides is exposed and in other places covered with a thin layer of soil. Much of the steep slopes is covered with a growth of mosses, including hairy-cap moss. On the less steep slopes and on the floor of the widest portions of the ravine grows a deciduous forest; black gum, northern red oak, bitternut hickory, shadbush, white oak, and hop hornbeam are some of the tree species. Wild hydrangea and winged sumac are common shrubs in this forest.

Devil's Prop is presently in private ownership.

13. FULTS HILL PRAIRIE

Fults hill prairie (Evers 1955) is located on the bluff south of Fults Creek, southeast of the village of Fults in Monroe County, about midway between Valmeyer and Prairie du Rocher. The prairie is a part

Fig. 21.-- A narrow, V-shaped valley through which a small stream flows in the Devil's Prop area.

of old French land grants, the longest boundaries of which were perpendicular to the bank of the Mississippi River. Such boundaries were common in St. Clair, Monroe, and Randolph counties.

The bluff on which the prairie is located trends northwest to southeast; the brow slope faces southwest. This bluff, like others in the vicinity, is tall, towering more than 300 feet above the adjacent bottomland, fig. 22. The limestone bedrock is exposed for some distance as a tall cliff. The toe slope of the bluff is talus. A blanket of loess caps the bedrock to form the brow slope, which varies in width. This slope is widest at the northwest, where there are sizable spurs and coves. Southeastward the brow slope is not so wide, and the spurs and coves are poorly defined. At the extreme southeast, however, the brow slope widens and supports a broad expanse of prairie.

Vegetation of the bluff is of two types. The toe slope and the larger coves on the brow slope support deciduous forest. The spurs and the remainder of the brow slope are prairie. At the top of the cliff is a narrow rock ledge. The tall cliff faces are devoid of plants except for a few ferns and a few composites.

Fults hill prairie is not rich in plant species. As on other hill prairies, little bluestem is the dominant grass. The rare or semirare species this hill prairie contains make it important as a natural area. The bedstraw *Galium virgatum* is known in Illinois only at this site, where it grows abundantly at the base of one prairie spur. Scattered plants of bluehearts grow in this prairie. The rare *Heliotropium tenellum*, first reported in Illinois from this site (Evers 1951), and stickleaf grow on the rock ledge.

Fig. 22.-- Fults hill prairie, southeast of Fults, Monroe County, as seen from the adjacent bottomland. Several rare species of plants and animals live on this bluff.

Fults hill prairie and bluff are in private ownership. On the northwest section of the bluff-top is a cemetery surrounded by pastureland. The remainder of the brow slope has not been pastured and has been little disturbed by man.

14. FOUNTAIN BLUFF

Fountain Bluff, in Jackson County, is located south of Gorham and north of Grand Tower. It is an outlier of the bluffs of the west side of the Mississippi River valley; it was isolated by the diversion of the river from its main valley on the east into a narrower valley on the west. The older valley on the east is 4 miles wide; the one on the west is about 1 mile wide.

Fountain Bluff is 4 miles long and 1.8 miles across at the widest point; it has a perimeter of slightly more than 10 miles. Limestone of the Chester series, which scarcely outcrops at the south end of this outlier, is overlain with Caseyville sandstone. This massive sandstone forms the spectacular cliffs of Fountain Bluff. In a number of places the sandstone has been eroded to form large ravines or small valleys, some of which have been named. Loess caps the sandstone. The highest elevation on Fountain Bluff is 779 feet above sea level or 419 feet above the floor of the valley to the east and about 430 feet above the Mississippi River to the west.

Approximately a dozen farm homes are located at the base of the cliffs and in the largest ravine, known as Happy Hollow. A road follows the creek through Happy Hollow for a mile before it ascends to the top of the ridge on the west and then trends about a mile northeastward to the point of highest elevation, the site of Fountain Bluff Lookout Tower, a structure removed before 1950. On the east side of Fountain Bluff, three cemeteries, Goodbread, Henson, and Hudson, occupy small areas. A railroad, a branch of the Illinois Central from Carbondale to Gale, skirts the base of Fountain Bluff on the north and west. Years ago a station, Fountain Bluff Station, stood at the mouth of a beautiful ravine on the northwest side of the bluff, fig. 23. Later a dam was constructed across this ravine, near its mouth, to impound water for a swimming pool. Both station and pool have disappeared. The pool was filled by silt carried in by running water. The silt now supports semiaquatic and mesic plants.

On the west side of Fountain Bluff is another large ravine, Trestle Hollow. On the southwest, not on the bluff but on the riverbank and adjacent bottomland, several industries -- a grain loading dock, a sand

Fig. 23.— Mouth of the ravine at the site of the old Fountain Bluff station. This is the only sizable break in the tall sandstone cliff in the north side of the bluff.

and gravel company, and a power station -- have developed. Three power lines from the power station cross Fountain Bluff. Two extend eastward; the third stretches northward for some distance on the crest of the bluff ridge along the Mississippi River.

The vegetational cover of Fountain Bluff is mostly deciduous forest; it is interspersed with small prairie openings and one large hill prairie. A small area serves as agricultural land for crop and livestock production and as a site for a commercial enterprise. The dominant tree of the forest appears to be the tulip tree. This tree grows on the slopes and in the ravines. Associated with this species is northern red oak, black oak, white oak, chinquapin oak, and white ash. In the valleys or ravines the sycamore, beech, honey locust, hard maple, and American and slippery elms grow profusely. Black locust evidently was once widely planted in the area. The understory trees include sassafras, redbud, flowering dogwood, hop hornbeam, Iowa crabapple, and blue beech. Common shrubs and vines are poison ivy, spicebush, wild hydrangea, and the introduced Japanese honeysuckle. In some places, this honeysuckle has become a pest; it covers the ground surface, forms a dense growth on tree trunks, fig. 24, and completely covers small shrubs. Many ferns and herbaceous flowering plants, including rare orchids, grow in the moist ravines. Mosses are ordinarily common on the soil surface,

Fig. 24.— Japanese honeysuckle in the Fountain Bluff area. This plant forms a dense cover over the ground and on shrubs; also, it forms a dense columnar growth on tree trunks.

and both mosses and liverworts abound on the moist sandstone outcrops and cliffs in the ravines. Of interest to botanists are the numerous patches of plume grass that are scattered on the ridge top to the north and at the base of the bluff to the east. This grass may reach heights of 8 feet or more, fig. 25.

Fig. 25.-- Plume grass on Fountain Bluff. These culms are over 8 feet tall.

Fig. 26.-- One of the small prairie openings on a ridge top on the western side of Fountain Bluff.

The prairie openings are small and most of them are on the ridge tops, fig. 26. The one sizable hill prairie of this area is situated on the southwest-facing ravine slope at the northern end of Fountain Bluff (Evers 1955). The dominant grass of the prairie types is little bluestem; big bluestem and Indian grass are not uncommon.

15. GRAND CANYON

Grand Canyon natural area, located about 8 miles southwest of Murphysboro, Jackson County, occupies the southeast quarter of section 35 and the southwest quarter of section 36, T. 9 S., R. 3 W., the west half of section 1, and much of section 2, T. 10 S., R. 3 W.; it is more than 700 acres in extent. The names Chalk Bluff, Hickory Ridge, and Viney Ridge are applied to the area or to parts of it.

This natural area is a part of the bluff system of the Mississippi River valley. From the floodplain the bluffs rise precipitously 360 feet, reaching an altitude of 720 feet above sea level. The tall, west-facing cliff in section 2 is about 0.75 mile in length and is named Chalk Bluff. The cliff is plainly visible from Fountain Bluff, 4 miles to the west, and from other points in the river valley. Above the tall cliff lies a stony slope; loess caps the bluff.

To the north of Chalk Bluff is a large valley, not quite 0.25 mile across, that is tributary to the Mississippi. This tributary valley, known as Grand Canyon, has steep walls and cliffs. To the south of Chalk Bluff is Clear Creek. This stream flows in a rather broad valley approximately 0.5 mile wide and enters the Big Muddy River, which here flows southward through the Mississippi River floodplain. From Grand Canyon, sizable ravines trend upslope to the south and from Clear Creek valley similar ravines trend upslope to the north to dissect the area into a series of deep ravines separated by ridges. The main ridge, which trends eastward from Chalk Bluff, almost midway between Grand Canyon and Clear Creek, is known as Viney Ridge. A half mile east of Chalk Bluff is Hickory Ridge. On this ridge the United States Forest

Service has constructed a lookout tower. The elevation at this site is 740 feet; from the tower a view of the ridges and bottomland is obtained, fig. 27.

The ridges support a mixed forest, including such species as chinquapin oak, northern red oak, black oak, sweet gum, bitternut hickory, tulip tree, and red cedar. Hop hornbeam, Hercules' club, and redbud grow as understory trees. Poison ivy, smooth sumac, and winged sumac are common shrubs. In some places two species of greenbrier form dense, almost impenetrable patches. Plume grass grows profusely in some of the small openings of the ridge top and also on some slopes.

The ravine slopes support a forest that includes some of the species enumerated above and also beech and tulip tree, which are very abundant. The understory includes flowering dogwood, papaw, and, along the rivulets, the blue beech. On these slopes the Christmas, the maidenhair, the broad beach, the glade, and other ferns are not uncommon. In spring, numerous wild flowers clothe the slopes.

When I visited this area in 1949, a small hill prairie occupied part of the west-facing brow slope at the northern extremity of Chalk Bluff. Little bluestem was the dominant grass. Scattered throughout the prairie were small hickories, sassafras, and white oak (Evers 1955).

The bottomland forest beyond Chalk Bluff toward the Big Muddy River contains such species as overcup oak, swamp white oak, pin oak, pecan, and big shellbark hickory.

Grand Canyon harbors some rare and semirare plant species: the clubmoss *Lycopodium lucidulum*, which grows on a sandstone cliff of one of the tributary ravines (Evers 1950); sphagnum moss, which covers a sizable, moist sandstone outcrop in another ravine; and several orchids, including Wister's coralroot and twayblade.

Fig. 27.— Deciduous forest as seen from Hickory Ridge Lookout Tower in the Grand Canyon area.

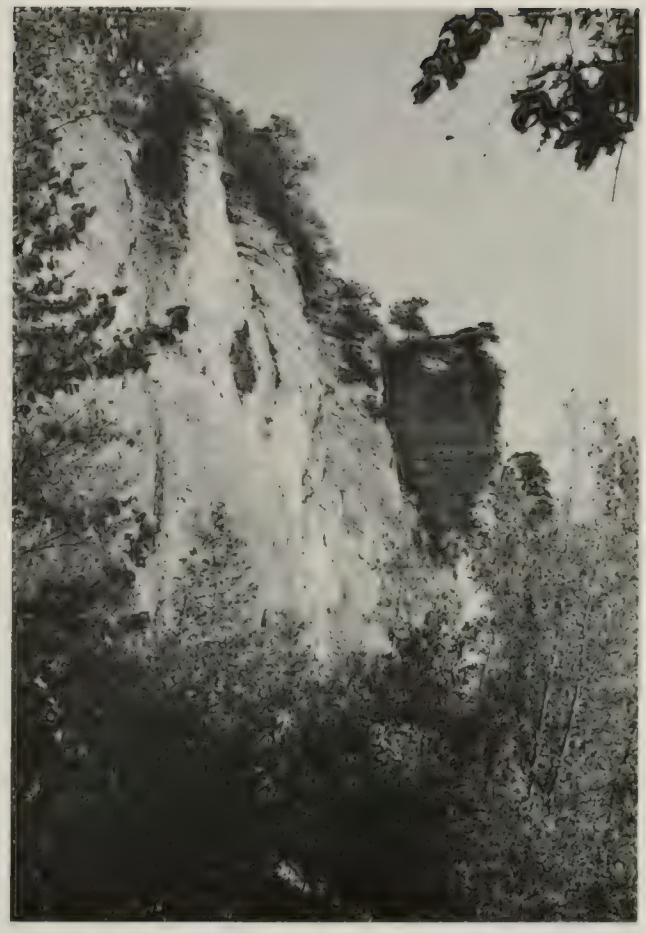

Fig. 28.-- Cherty limestone cliff on the bluffs of the Mississippi River at Pine Hills. This cliff rises to a height of 100 feet above the nearby bottomland.

Much of Grand Canyon natural area is under the supervision of the United States Forest Service, but some parts remain in private ownership.

16. PINE HILLS AND WOLF LAKE

One of the most beautiful localities in Illinois is Pine Hills and the adjacent Wolf Lake and Larue swamps in Union County. No matter what the season is -- winter, spring, summer, or autumn -- this place abounds in natural beauty. It is located in sections 3, 4, 9, 10, 15, 16, 21, 22, 27, 28, 33 and 34, T. 11 S., R. 3 W., and sections 3 and 4, T. 12 S., R. 3 W. The hills extend 6 miles north from the village of Wolf Lake.

The bluffs of the Mississippi River that form Pine Hills are underlain with cherty limestone that outcrops to form sizable cliffs up to 100 feet high, fig. 28. Cherty slopes lie above the cliffs, and loess caps the bluffs. At the cliff bases, toe slopes of various sizes have been formed of rock fragments that have spalled from the cliff faces. The swamps are in the bottomland adjacent to the bluffs, fig. 29. They occupy the old channel of the Big Muddy River, which enters the Mississippi River valley west of Murphys-

boro, Jackson County, and meanders southward along the bluffs into section 4, T. 11 S., R. 3 W., then southwestward and westward to enter the Mississippi River below Grand Tower. In earlier days, the Big Muddy continued its course southward along the bluffs. Present-day Otter Pond and Wolf Lake are parts of the old river channel. Big Muddy is an example of a Yazoo River type of tributary.

The vegetation of Pine Hills is mostly deciduous forest. Prairie openings and one hill prairie (Evers 1955) are found here. The toe or talus slopes of the bluffs are forested, as are the ravines that extend eastward into the bluffs. The south-facing ravine slopes are covered with xeric oaks and hickories and some prairie herbs, the north-facing slopes with mesic forest, including tulip tree and hard maple. The cliffs support few plants except scattered individuals of cliff brake, some species of goldenrod, especially Drummond's, and red cedar.

The brow slopes above the cliffs maintain forest in some places, prairie in others. Some of this prairie is of the typical hill type, with little bluestem the dominant grass, and some exists as small openings within the forest. The forest is a mixed deciduous type, with southern yellow pine and pink azalea as unusual species. Southern yellow pine is restricted in Illinois to two localities: Pine Hills and southern Randolph County to the north. Farkleberry is a common shrub on the Pine Hills slopes. These slopes are also the type locality of *Liatris scabra*, a species of blazing star that was first described from collections made here.

Fig. 29.-- Bottomland swamp as seen from the bluff top in the Pine Hills area.

Fig. 30.— One of the coves of Horseshoe Lake. When this picture was taken, mosquito fern completely covered the surface of the cove to give the effect of a lawn rather than open water.

The swamps are of interest botanically for the occurrence of several species that are rare in Illinois. Several species of duckweeds, including *Wolffiella floridana*, live in the water of this swamp, as do frogbit and swamp loosestrife, the last a species more common much farther north. Here can also be found the rare grass *Glyceria pallida*.

Part of Pine Hills and the adjacent swamps is in the Shawnee National Forest, part in the Southern Illinois University Biological Station, and part in private ownership.

17. HORSESHOE LAKE

Picturesque Horseshoe Lake, located south of Olive Branch, occupies parts of 12 sections in T. 16 S., R. 2 W., in Alexander County. The outline of the lake, which somewhat resembles a horseshoe, possibly suggested the name. The lake was formed from an old meander of the Mississippi River, which is now several miles to the west. The east arm of the lake is approximately 3.75 miles long and 0.25 mile across. To the northwest is a mixture of small lakes and swamp areas. Stretching from the northwest are two arms. One trends southeastward, is about 2.75 miles long and 0.25 mile across, and joins the east arm about 0.5 mile north of the southern extremity of the lake. Between this, the central arm, and the east arm is an island, about 2 miles long and 0.5 mile wide. The other arm, the western, trends southward for 0.5 mile, where a levee impounds the water and prevents its flow to the old lake bed that stretches on farther to the south. A dam and spillway at the south ends of the eastern and central arms control to some extent the water level of the lake. Overflow at the dam enters Lake Creek and flows northeastward into the Cache River. Runoff from the surrounding farmland and several small creeks to the north, including Pigeon Roost Creek, supply water to the lake. During the dry seasons, several large wells augment this supply. The lake and some of the surrounding area serve as a state wildlife refuge.

The native vegetation of the refuge can be classified as (1) forest and (2) aquatic and semiaquatic. On the island and on some of the land to the west of the central arm are cultivated fields of corn, sunflowers, and soybeans. The products of these fields serve as food for the Canada geese that come here in huge numbers in October and remain until March.

Floating on or just beneath the surface of the lake, sometimes densely covering immense areas, are several duckweeds, including the rare *Wolffiella floridana*. The mosquito fern floats in such numbers on the water, either with the duckweeds or in pure stands, that the surface of some parts of the lake is completely covered, fig. 30, and assumes a purplish hue. Hornwort and other aquatic plants grow submerged in the lake. Bald cypress and tupelo rise from the shallow water to produce the picturesque appearance of Horseshoe Lake, fig. 31. In small, shallow pools of the west arm, American lotus covers large areas. The vast numbers of large, circular leaves rise from the water to heights of 6 feet. In July and August, thousands of cream-colored flowers, 6 inches or more across, appear over the leafy mass.

In the very shallow water along the shore, such plants as arrowhead, pickerel weed, and primrose-willow are frequently observed. Other plants of the fluctuating shoreline are buttonbush, swamp privet, swamp honey locust, swamp cottonwood, Drummond's maple, box elder, and numerous herbs, including *Eclipta alba*.

On slightly higher ground bordering the lake shore, other tree species grow in profusion. Shingle, pin, swamp white, overcup, and southern red are the most common of the species of oaks. Soft maple is common; basswood is scattered here and there, as are black walnut and pecan. Three vines are common on trunks of the trees: Virginia creeper, trumpet creeper, and poison ivy. Two additional vines, raccoon grape and passion flower, are less common but can be easily found. In the plant community bordering the lake, clearweed, false nettle, and water horehound are abundant.

Numerous picnic tables have been placed near the lake and close to some of the all-weather roads. The island is usually closed to the public. The overwintering geese attract to this area numerous hunters and bird watchers who, it is estimated, spend over a million dollars annually in Cairo and the vicinity.

Horseshoe Lake Wildlife Refuge is under the supervision and control of the State of Illinois Department of Conservation.

18. CACHE RIVER SWAMPS

Remnants of once vast cypress swamps are found in a number of localities in southern Illinois, including the Cache River valley and the broad valley that

Fig. 31.-- Bald cypress and tupelo growing in the water of Horseshoe Lake, Alexander County. Primrose-willow also grows in the water here (foreground).

Fig. 32.-- Cypress swamp in the Cache River bottomland. The "knees" that grow up to 7 feet tall tend to surround the bald cypress trees. This picture was taken during the dry season.

extends from Belknap eastward to the Ohio River. (A view of the Cache River is shown on the cover.) In preglacial times, it was not the Cache but an extension of the present Cumberland River that flowed through this valley; the Cache was then a tributary that entered the larger valley where it does now, that is, between Belknap and Forman, Johnson County. After glaciation, the Cumberland emptied into the Ohio; the Cache followed the preglacial valley of the the Cumberland and flowed westward and southward to empty sometimes into the Ohio and sometimes into the Mississippi. In this valley are numerous remnants of cypress swamps, two of which are especially noteworthy for both plants and animals.

Two and one-half miles west and 1 mile north of Karnak is a sizable remnant of a cypress swamp. It occupies parts of sections 7 and 8, T. 14 S., R. 2 E., in Johnson and Pulaski counties. The river here serves as the county line. Illinois highway 37, which carries much traffic from Chicago to Cairo, traverses this swamp from north to south. The Cache River here occupies a part of the preglacial Cumberland valley.

During much of the year the ground is inundated, often by as much as 6 feet of water, but frequently in the dry season -- late summer and early autumn -- the water recedes and it is possible to walk in the swamp. The large trees of this swamp are bald cypress and tupelo, both of which have buttressed bases. Many of the bald cypresses are surrounded by pneumatophores or knees, fig. 32, that grow up to 7 feet high. Other trees of this swamp are overcup oak, swamp cottonwood, Mississippi hackberry, river birch, Drummond's maple, swamp honey locust, and water elm. The last is limited in Illinois to a few of the cypress swamps.

Common shrubs in the Karnak swamp include swamp privet, buttonbush, and, less frequently but still locally abundant, Virginia willow. Trumpet creeper is a very abundant vine in this swamp; *Brunnichia cirrhosa* grows along the border.

The floor of the swamp near the border supports a growth of herbaceous plants, including lizard's-tail, false nettle, a rare milkweed named *Asclepias perennis*, and clearweed. Deep in the swamp the floor is mostly devoid of vegetation except for seedlings of some trees. On decaying logs that float when water is present or rest on the swamp floor in the dry season are found peculiar plant associations that have such species as clearweed, Virginia willow, beggarticks, the small composite known as *Eclipta alba*, and marsh St. John's-wort crowded together.

The large number of sizable bald cypress trees in this swamp is of interest to botanists. Some individual trees are 3.5–4.0 feet in diameter above the buttressed bases. Several specimens measure 5.0–5.5 feet in diameter and up to 100 feet tall. Also of interest to botanists is the polypody found growing as an epiphyte on a single ash tree.

Another cypress swamp remnant in the Cache River valley is a mile north and one-half mile east of Belknap or slightly more than a mile southwest of Forman in Johnson County. It is located in the northeast quarter of section 36, T. 13 S., R. 2 E., and occupies about 100 acres. This is in the preglacial Cache River valley and is near the point where the Cache enters the larger valley of the preglacial Cumberland. The area of biological interest embraces not only the cypress swamp but also the forested bluff to the south of the swamp; at the base of the bluff is a spring.

The forest trees of the bluff include hard maple, black walnut, hickories, sweet gum, mulberry, and papaw. Poison ivy is the most abundant shrub under the forest canopy, but wild hydrangea and spicebush

Fig. 33.-- A decaying log on the floor of a Cache River cypress swamp. An interesting association of plants grows on such logs, which are afloat during wet seasons and grounded during dry periods.

are frequent. Buttonbush is found at the base of the bluff. The herbaceous flora of the bluff is rich in species. Numerous grasses, sedges, and ferns grow on the stony slope. In the vicinity of the spring at the base of the bluff, clearweed, wild hydrangea, false nettle, and touch-me-not are common.

At the border of the swamp and bluff base, several plants of the rare spider lily grow under the soft maples and American elms. In the swamp, the bald cypress grows abundantly and the pneumatophores are very common on the swamp floor. Associated with the bald cypress are big shellbark hickory, Drummond's maple, swamp cottonwood, overcup oak, and other trees. Common vines in this area are catbird grape and trumpet creeper. Erect shrubs include swamp privet, buttonbush, Virginia willow, and swamp rose.

Not all of this swamp floor supports an herbaceous vegetation, but where the herbs grow can be found ditch stonecrop, lizard's-tail, skullcap, and the beautiful, deep red cardinal flower. Among these are scattered plants of *Asclepias perennis*. The associations of plants on the decaying logs, fig. 33, are similar to those in the Karnak swamp.

The two swamps described here are in private ownership.

19. THORNTON'S RAVINE

Thornton's Ravine is located along the Ohio River about 5 miles downstream from Metropolis or slightly more than 2 miles upstream from Joppa, in Massac County. The ravine, which occupies parts of sections 19, 20, 29, and 30, T. 15 S., R. 4 E., extends northward from the bank of the river for approximately 0.5 mile. Because of its propinquity to the river, the ravine is subjected to periodic flooding. The floodwaters at times inundate most of the length of the ravine, except the uppermost slopes. The slopes and floor of the ravine lack rock outcrops.

Some of the flat uplands adjacent to the ravine serve as pastureland and some as orchard land. The ravine itself is forested; the upper half is grazed, the lower half, that nearer the Ohio River, is ungrazed. At the mouth of the ravine, which opens into the Ohio River valley, is a narrow floodplain that for several years was planted in corn but that in 1961, when I last visited it, was idle as part of the Soil Bank program. The bank of the river, composed mainly of silt and small pockets of gravel, supports a growth of black willow, soft maple, cottonwood, and sycamore. Swamp privet is the common shrub, and two species of primrose-willows are among the many herbaceous plants that thrive on the riverbank. The forest at the mouth of the ravine includes bald cypress, red maple, sweet gum, and overcup oak. Gama grass is common and poison ivy is very abundant.

Farther up the ravine from the river the notable trees are big shellbark hickory, persimmon, Mississippi hackberry, box elder, hop hornbeam, and silver-bell tree, fig. 34. According to Herman Thornton, a local resident, squirrels are abundant and they greedily devour the fruits of the silver-bell tree. Many of the silver-bell trees are small, but one has a diameter at breast height of approximately 8 inches. An occasional shadbush can be observed with the numerous redbuds, especially in the spring before the foliage appears. The most common shrub is spicebush. Of the numerous herbaceous plants in this forest, two deserve attention. Blood-leaf and *Dicliptera brachiata*, both rare in Illinois, grow near the mouth of the ravine, a part subjected to heavy flooding.

Fig. 34.— A silver-bell tree about 8 inches in diameter growing in Thornton's Ravine, near Joppa, Massac County.

Thornton's Ravine is in private ownership.

20. FORT MASSAC STATE PARK

Fort Massac State Park is located along the north bank of the Ohio River, east of Metropolis, Massac County. Easily reached from highway US 45, the park occupies 840 acres of riverbank and bottomland woods. The locality was set aside as a state park because of its historical interest. It is the site of Fort Massac, also called Fort Cherokee.

Perhaps the first biologist to visit Fort Massac was the French botanist Andre Michaux, who arrived on Thursday, October 8, 1795. He botanized in the area -- in both Illinois and Kentucky -- until November 6, when he returned to Kaskaskia. What Michaux saw and what the visitor today can see in the area are vastly different. The large bottomland forests and swamps have been cut and drained; only remnants remain. One of the trees of this bottomland is the willow oak, fig. 35. Its numbers have dwindled since

the time of Michaux. Sizable trees of this species once lined the highway south of Mermet. A few years ago, when this highway was being widened, the forest bordering the right-of-way was cut and these trees were destroyed. Several sizable willow oak trees remain in Fort Massac State Park and thus are afforded some measure of protection. The number of willow oaks in the Black Bottom east of the park is decreasing. Soon persons looking for this plant in Illinois may be able to see it only at Fort Massac.

Fig. 35.— Willow oak growing in Fort Massac State Park. This tree is rare in Illinois.

21. JACKSON HOLLOW

Jackson Hollow occupies about 320 acres in R. 5 E., and in section 6, T. 12 S., R. 5 E., to the west of Little Bay Creek and a section of the Illinois Central Railroad, the section that is commonly called the Edgewood cutoff.

Much of the beauty of Jackson Hollow, like that of so many other beautiful sites in southern Illinois,

Fig. 36.— A huge undercut in Jackson Hollow, Pope County. Filmy fern grows at the back of this undercut. The two figures near the center serve as a scale to determine size.

results from the tall cliffs and the numerous, adjacent rock blocks that strew the slopes from the cliffs to the creeks. The cliffs and blocks are sandstone. Below the sandstone, in some places, layers of coal and shale are exposed. The sandstone is subjected to erosion by water and, in those places where streams of water flow at the cliff bases or cascade over the cliffs, huge undercuts, locally called caves, have been formed by the breaking away of large masses of rock, fig. 36. The small creeks in Jackson Hollow

Fig. 37.-- Rock selaginella growing in a mass of lichens. This species grows on sandstone in southern Illinois and also in sand prairie in central and northern Illinois.

flow across beds or fragments of sandstone, or beds of gravel or of sand, and, near Little Bay Creek, through deposits of silt.

The vegetation of Jackson Hollow falls into two main types, grassland and forest. Grassland is restricted to small prairie openings, most of them above the cliffs, or to fields of broomsedge that developed on abandoned land. Forests are represented by the mesic type, with beech, hard maple, and tulip tree, and by the xeric type, with certain oaks and hickories. The former type occupies the spaces below the cliffs, the latter the dry, stony slopes above the cliffs. Smooth alder, river birch, blue beech, and willows thrive along the streams, especially on the banks of Little Bay Creek at the mouth of Jackson Hollow. Farkleberry is a common shrub on the stony slopes above the cliffs. The sandstone ledges support numerous lichens, some grasses, and innumerable patches of the moss *Grimmia*, which when wet are deep green but when dry are almost black.

Many unusual plants occur in Jackson Hollow. The orchid *Tipularia discolor* was collected here (Mohlenbrock & Voigt 1959). The first collection of filmy fern in Illinois was made in this locality by Dr. Mary M. Steagall of Southern Illinois University, August 2, 1923. The fern was reported to grow in two of the numerous undercuts in the sandstone cliffs (Evers 1961). On April 8, 1963, Dr. Warren H. Wagner, Jr., professor of botany, University of Michigan, accompanied me to Jackson Hollow and he discovered a third stand in a cleft in one of the cliffs. On May 13, 1963, I found a fourth stand in an undercut. This brings to 11 the number of stands of this fern in Illinois. The clubmoss *Lycopodium lucidulum* grows on a flat sandstone surface in one moist ravine and rattlesnake plantain grows nearby. Professor Wagner and I found another clubmoss, *L. porophilum*, on one of the sandstone cliff faces. A number of orchids, including puttyroot, grow scattered throughout. Indian pipe and beech-drops are not rare here. Above the cliffs, rock selaginella, fig. 37, and talinum thrive in scattered patches.

Presently Jackson Hollow is owned by the federal government and is under the control of the United States Forest Service.

22. BELL SMITH SPRINGS

Several miles east of Jackson Hollow is another of the numerous beauty spots of southern Illinois -- Bell Smith Springs Recreational Area. It lies southeast of the community known as McCormick, in Pope County. Within the area, Spring Branch, Hunting Branch, and Hill Branch enter Bay Creek, which then

Fig. 38.-- A gorge cut into the sandstone along Hill Branch at Bell Smith Springs, Pope County. The steep upper slopes are in many places covered with mosses and lichens.

Fig. 39.— A beech-maple forest between the sandstone cliff and Bay Creek at Bell Smith Springs. This path leads the visitor to the natural bridge.

flows southward. Most of the area is in sections 33 and 34, T. 11 S., R. 5 E.

The huge cliffs and the small to massive blocks that strew the slopes between the cliffs and streams are sandstone. Cliffs have numerous undercuts, and a large natural bridge is developing along Bay Creek, north of Spring Branch. Many years ago, Hill Branch cut into the sandstone and at one place formed a sizable gorge, fig. 38. Beyond the gorge, downstream, the bed of Hill Branch is strewn with rock fragments. The beds of Hunting and Spring branches are of similar aspect. In some places the streams are shallow and have riffles or small falls; in other places they are deep and form quiet pools. Visitors use some of the large, deep, quiet pools as swimming holes, fig. 1.

The vegetation of Bell Smith Springs is deciduous forest, with prairie openings. Rock ledges and cliffs provide interesting plant habitats (Winterringer & Vestal 1956). A mesic forest, with beech and hard maple as the most common species, occupies the stream valleys, fig. 39. Above the cliffs several species of oaks and hickories replace the beech and maple. Along the stream banks the red maple, river birch, smooth alder, and Virginia willow thrive. Spicebush is a common shrub in the valley forest; farkleberry is common in the dry forests above the cliffs. Mosses, liverworts, and lichens clothe many of the moist, shaded overhangs. Some cliff faces lack plants and some support growths of lichens and a few ferns. A few hardy composites thrive in some of the cliff recesses. Some rock ledges are bare, but most are clothed with lichens and bryophytes. Vascular plants grow in crevices of the ledges or in the small pockets of soil that accumulate on the surface of the rock. In one overhang, the filmy fern grows in scattered patches.

This area, under the control of the United States Forest Service, is used to some extent as a picnic area. The name is sometimes spelled "Belle Smith Spring," and for many years the name so spelled was carved on the Forest Service sign at the entrance. According to Allen (1949), the name should be Bell Smith.

23. HAYES CREEK CANYON

Hayes Creek Canyon, less than a mile north of Eddyville, Pope County, occupies part of section 31, T. 11 S., R. 6 E., and part of section 6, T. 12 S., R. 6 E. In this locality, Hayes Creek flows southward over beds of sandstone. A tributary stream from the east flows over similar beds and has cut a steep gorge at the escarpment, fig. 40. Some distance below the escarpment this tributary joins Hayes Creek, which then flows southwestward.

The types of vegetation at Hayes Creek Canyon are similar to those at Bell Smith Springs. Rock selaginella and *Selaginella apoda*, fig. 41, grow on the sandstone, and the filmy fern grows in two stations about one-fourth mile apart. Christmas fern, common wood fern, and common polypody are the abundant ferns in this area. Twayblade grows in the moist woods along the stream.

An excellent nature trail could be constructed from Ozark, in Johnson County, eastward through Camp Packentuck, now abandoned, Jackson Hollow, Bell Smith Springs, through Spring Branch to Cedar Grove Church, eastward past Cedar Head, to Hayes Creek Canyon and Lusk Creek. Hikers would then have another scenic trail over hills and through valleys in southern Illinois.

Fig. 40.— The gorge of a tributary stream at Hayes Creek Canyon, north of Eddyville, Pope County.

Fig. 41.— A selaginella, *Selaginella apoda*, which grows on the moist sandstone of Hayes Creek Canyon.

24. LUSK CREEK CANYON

Lusk Creek Canyon, also known as Lusk Creek Gorge, is the most beautiful stream valley in southern Illinois and perhaps in the entire state. Lusk Creek drains much of northeastern Pope County. Its source is near Delwood, a small community on Illinois highway 145. As the creek flows southward, it is joined by numerous tributary streams and finally empties into the Ohio River at Golconda. The locality of special interest is the valley of Lusk Creek as it passes through sections 33 and 34, T. 11 S., R. 6 E., about 2.5 miles east and 1.5 to 2.0 miles north of Eddyville.

In this locality, Lusk Creek has cut through the massive sandstone, carving a valley, canyon, or gorge with cliffs that vary from only a few feet to almost 100 feet high. In some places, the valley floor is moderately wide and the bluffs of the stream have steep toe slopes beneath the cliffs. In a few places, there is no valley floor except that which the creek occupies. The creek in some areas is shallow and flows swiftly around numerous rocks and over riffles; in others it is deep and forms quiet pools. A canyon in section 34 is hairpin- or horseshoe-shaped. The cutbank of this canyon or gorge is a towering, vertical sandstone cliff almost devoid of vegetation, fig. 42. The slip slope -- the slope opposite the cutbank -- is not vertical but rather a steep sandstone slope that is clothed with mosses, lichens, and deciduous trees. Near the summit of this canyon is the Indian Kitchen. The summit of the ridge, the area within the horseshoe, is quite rocky; the sandstone is exposed as large ledges, with only a few large blocks near the cliff tops.

Upstream from this beautiful gorge, Lusk Creek flows between steep cliffs and within 0.5 mile it makes a right angle bend. At this point, Bear Creek joins Lusk Creek. The cliffs along Bear Creek are tall at this junction but decrease in height upstream and finally disappear as the creek flows over the upper surface of the sandstone escarpment. The cliffs along Lusk Creek, upstream from the Bear Creek junction, are quite tall; approximately 0.5 mile north of the junction they reach a height that is tremendous for Illinois.

Above the cliffs of Lusk Creek are slopes of varying steepness. The less steep slopes were cultivated in earlier days but now are deserted fields or have been converted into pine plantations. Some prairie plants thrive in the deserted fields. The upland above Indian Kitchen and within the horseshoe supports a xeric forest, with red cedar, black-jack oak, and farkleberry as common plants.

Deciduous forest covers the toe slopes of the bluffs. Beech, hard maple, red maple, river birch, alder, and sycamore grow near the stream, oaks and hickories higher up the slopes. The cliffs vary from extremely dry and lacking plant life to very moist and abounding in mosses, liverworts, lichens, and small herbaceous plants, including asters and goldenrods. On one of these cliffs the clubmoss *Lycopodium complanatum* var. *flabelliforme*, fig. 43, grows, the only known site of this species in Illinois. Partridge berry and sphagnum moss are not uncommon on the moist cliffs.

Fig. 42.— The deep gorge along Lusk Creek, northeast of Eddyville, Pope County. The cliff supports little plant life; the slip slope is covered with mosses, lichens, and some trees.

Fig. 43.—The club moss *Lycopodium complanatum* var. *flabelliforme*, which is known in Illinois only from a site bordering Lusk Creek.

In the area of Lusk Creek, I have on several occasions seen the pileated woodpecker. Turkey vultures apparently nest in the recesses of the tall cliffs north of the junction of Lusk Creek with Bear Creek. Deer are abundant here, as they are in many other parts of southern Illinois.

In the springtime, the abundant flowers of the shadbush and dogwood create a beautiful sight. And here in autumn the pastel colors of the oak leaves on the upper slopes, most beautiful and restful to the eyes of the observer, provide a never-to-be-forgotten experience.

Most of the Lusk Creek Canyon area is a part of the Shawnee National Forest. A small part is in private ownership.

RECAPITULATION

These and other natural areas of our state are of great value to scientists of Illinois and elsewhere. To nonscientists, these natural areas are also of value. Although nonscientists may never carry out biological studies, the natural areas offer them opportunities to see bits of the forests and prairies for which Illinois was once famous and to observe the plants and animals, both common and rare, in some of these interesting habitats. It is in these places that they can relax and listen to the sounds of nature. Many persons receive a lift from such relaxations. In our society, which requires a rapid pace but also provides much leisure time, these individuals deserve consideration. The observers of nature should be provided with places where they can enjoy their leisure hours and where they can relax, just as others have been provided with hunting, fishing, boating and playground areas.

I have attempted to take you, the readers of this article, very quickly through 24 natural or scientific areas of the State of Illinois by means of descriptions and photographs. I hope this vicarious journey may arouse an ardent desire in some of you to visit these localities, at least the ones nearest home. Enjoy yourselves in these places. Help preserve them for future generations.

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SCIENTIFIC EQUIVALENTS OF COMMON NAMES OF PLANTS CITED

Alder, smooth — *Alnus serrulata* (Ait.) Willd.
Arbor vitae — *Thuja occidentalis* L.
Arrowgrass — *Triglochin maritima* L.
T. palustris L.
Arrowhead, common — *Sagittaria latifolia* Willd.
Arrowwood — *Viburnum dentatum* L.
Ash, blue — *Fraxinus quadrangulata* Michx.
Ash, prickly — *Zanthoxylum americanum* Mill.
Ash, wafer — *Ptelea trifoliata* L.
Ash, white — *Fraxinus americana* L.
Aspen, large-toothed — *Populus grandidentata* Michx.
Aspen, quaking — *Populus tremuloides* Michx.
Aster — *Aster* spp.
Aster, narrow-leaved — *Aster linariifolius* L.
Azalea, pink — *Rhododendron roseum* (Loisel.) Rehd.
Basswood — *Tilia americana* L.
Bearberry — *Arctostaphylos uva-ursi* (L.) Spreng.
Beard-tongue — *Penstemon* spp.
Bedstraw — *Galium* spp.
Beech — *Fagus grandifolia* Ehrh.
Beech, blue — *Carpinus caroliniana* Walt.
Beech-drops — *Epifagus virginiana* (L.) Bart.
Beggar-ticks — *Bidens* spp.
Birch, dwarf — *Betula pumila* L.
Birch, river — *Betula nigra* L.
Bittersweet, climbing — *Celastrus scandens* L.
Blackberry — *Rubus* spp.
Bladdernut — *Staphylea trifolia* L.
Bladderpod — *Lesquerella ludoviciana* (Nutt.) Wats.
Blazing star — *Liatris aspera* Michx.
L. pycnostachya Michx.
Blood-leaf — *Iresine rhizomatosa* Standl.
Blue-eyed grass — *Sisyrinchium albidum* Raf.
Bluehearts — *Buchnera americana* L.
Bluestem, big — *Andropogon gerardi* Vitman
Bluestem, little — *Andropogon scoparius* Michx.
Box elder — *Acer negundo* L.
Broomsedge — *Andropogon virginicus* L.
Buckbean — *Menyanthes trifoliata* L.
Buckthorn — *Rhamnus lanceolata* Pursh
Buckthorn, alder — *Rhamnus frangula* L.
Bulrush — *Scirpus* spp.
Bunchberry — *Cornus canadensis* L.
Bur-reed, giant — *Sparganium eurycarpum* Engelm.
Buttercup, white — *Ranunculus aquatilis* L.
Butternut — *Juglans cinerea* L.
Buttonbush — *Cephalanthus occidentalis* L.
Cabbage, skunk — *Symphlocarpus foetidus* (L.) Nutt.
Cardinal flower — *Lobelia cardinalis* L.
Cattail — *Typha latifolia* L.
T. angustifolia L.
Cherry, wild black — *Prunus serotina* Ehrh.
Chokeberry — *Aronia melanocarpa* (Michx.) Ell.
Cinquefoil, purple — *Potentilla palustris* (L.) Scop.
Clearweed — *Pilea pumila* (L.) Gray
Cliff brake — *Pellaea atropurpurea* (L.) Link
Cocklebur — *Xanthium strumarium* L.
Compass plant — *Silphium laciniatum* L.
Coneflower, purple — *Echinacea pallida* Nutt.
Coralroot, Wister's — *Corallorhiza wisteriana* Conrad
Cordgrass, prairie — *Spartina pectinata* Link
Cottonwood — *Populus deltoides* Marsh.
Cottonwood, swamp — *Populus heterophylla* L.
Crabapple, Iowa — *Malus ioensis* (Wood) Britt.
Cypress, bald — *Taxodium distichum* (L.) Rich.
Dogwood — *Cornus* spp.
Dogwood, alternate-leaved — *Cornus alternifolia* L. f.
Dogwood, flowering — *Cornus florida* L.
Dogwood, rough-leaved — *Cornus drummondi* C. A. Mey.
Duckweed — *Lemna* spp.
Wolffia spp.
Elderberry — *Sambucus canadensis* L.
Elm, American — *Ulmus americana* L.
Elm, rock — *Ulmus thomasi* Sarg.
Elm, slippery — *Ulmus rubra* Muhl.
Elm, water — *Planera aquatica* (Walt.) Gmel.
Farkleberry — *Vaccinium arboreum* Marsh.
Fern, broad beech — *Dryopteris hexagonoptera* (Michx.) C. Chr.
Fern, Christmas — *Polystichum acrostichoides* (Michx.) Schott
Fern, cinnamon — *Osmunda cinnamomea* L.
Fern, common wood — *Dryopteris intermedia* (Muhl.) Gray
Fern, filmy — *Trichomanes boschianum* Sturm
Fern, fragile — *Cystopteris fragilis* (L.) Bernh.
Fern, glade — *Athyrium pycnocarpon* (Spreng.) Tidestr.
Fern, grape — *Botrychium virginianum* (L.) Sw.
Fern, lady — *Athyrium angustum* (Willd.) Presl
Fern, maidenhair — *Adiantum pedatum* L.
Fern, marsh — *Dryopteris thelypteris* (L.) Gray
Fern, mosquito — *Azolla caroliniana* Willd.
Fern, sensitive — *Onoclea sensibilis* L.
Fern, walking — *Camptosorus rhizophyllus* (L.) Link
Feverfew, American — *Parthenium integrifolium* L.
Frogbit — *Limnobium spongia* (Bosc) Steud.
Gama grass — *Tripsacum dactyloides* L.
Gentian — *Gentiana* spp.
Gentian, closed — *Gentiana andrewsii* Griseb.
Gentian, fringed — *Gentiana crinita* Froel.
Goat's rue — *Tephrosia virginiana* (L.) Pers.
Goldenrod — *Solidago* spp.
Goldenrod, Drummond's — *Solidago drummondii* T. & G.
Gooseberry — *Ribes cynosbati* L.
Grama, side-oats — *Bouteloua curtipendula* (Michx.) Torr.
Grape — *Vitis* spp.
Grape, catbird — *Vitis palmata* Vahl
Grape, raccoon — *Ampelopsis cordata* Michx.
Greenbrier — *Smilax bona-nox* L.
S. rotundifolia L.
Gum, black — *Nyssa sylvatica* Marsh.
Gum, sweet — *Liquidambar styraciflua* L.
Hackberry — *Celtis occidentalis* L.
Hackberry, Mississippi — *Celtis laevigata* Willd.
Hepatica — *Hepatica acutiloba* DC.
Hercules' club — *Aralia spinosa* L.
Hickory — *Carya* spp.
Hickory, big shellbark — *Carya laciniosa* (Michx. f.) Loud.
Hickory, bitternut — *Carya cordiformis* (Wang.) K. Koch
Hickory, shagbark — *Carya ovata* (Mill.) K. Koch
Honeysuckle, Japanese — *Lonicera japonica* Thunb.
Horehound, water — *Lycopus americanus* Muhl.
Hornbeam, hop — *Ostrya virginiana* (Mill.) K. Koch
Hornwort — *Ceratophyllum demersum* L.
Hyacinth, wild — *Camassia scilloides* (Raf.) Cory
Hydrangea, wild — *Hydrangea arborescens* L.
Indian grass — *Sorghastrum nutans* (L.) Nash
Indian pipe — *Monotropa uniflora* L.
Indigo, wild — *Baptisia leucophaea* Nutt.
Ivy, poison — *Rhus radicans* L.
Juniper, creeping — *Juniperus horizontalis* Moench
Ladies'-tresses, nodding — *Spiranthes cernua* (L.) Rich.
Ladyslipper, pink — *Cypripedium reginae* Walt.
Larch, European — *Larix decidua* Mill.
Lead plant — *Amorpha canescens* Pursh
Leatherleaf — *Chamaedaphne calyculata* (L.) Moench
Lily-of-the-valley, false — *Maianthemum canadense* Desf.
Lily, spider — *Hymenocallis occidentalis* (Le Conte) Kunth

Lizard's-tail – *Saururus cernuus* L.
Locust, black – *Robinia pseudoacacia* L.
Locust, honey – *Gleditsia triacanthos* L.
Locust, swamp honey – *Gleditsia aquatica* Marsh.
Loosestrife, swamp – *Decodon verticillatus* (L.) Ell.
Lotus, American – *Nelumbo lutea* (Willd.) Pers.
Love grass, sand – *Eragrostis trichodes* (Nutt.) Wood
Mallow, rose – *Callirhoe triangulata* (Leavenw.) Gray
Maple, Drummond's – *Acer rubrum* var. *drummondii* (H. & A.) Sarg.
Maple, hard – *Acer saccharum* Marsh.
Maple, red – *Acer rubrum* L.
Maple, soft – *Acer saccharinum* L.
Marigold, marsh – *Caltha palustris* L.
Mayapple – *Podophyllum peltatum* L.
Moss, hairy-cap – *Polytrichum* spp.
Mulberry – *Morus rubra* L.
Needle grass – *Stipa spartea* Trin.
Nettle, false – *Boehmeria cylindrica* (L.) Sw.
New Jersey tea – *Ceanothus americanus* L.
Oak – *Quercus* spp.
Oak, black – *Quercus velutina* Lam.
Oak, black-jack – *Quercus marilandica* Muenchh.
Oak, bur – *Quercus macrocarpa* Michx.
Oak, chinquapin – *Quercus muhlenbergii* Engelm.
Oak, Hill's – *Quercus ellipsoidalis* E. J. Hill
Oak, northern red – *Quercus borealis* var. *maxima (Marsh.)* Ashe
Oak, overcup – *Quercus lyrata* Walt.
Oak, pin – *Quercus palustris* Muenchh.
Oak, post – *Quercus stellata* Wang.
Oak, shingle – *Quercus imbricaria* Michx.
Oak, swamp white – *Quercus bicolor* Willd.
Oak, white – *Quercus alba* L.
Oak, willow – *Quercus phellos* L.
Orchid, grass-pink – *Calapogon pulchellus* (Salisb.) R. Br.
Osier, red – *Cornus stolonifera* Michx.
Panic grass, Scribner's – *Panicum oligosanthes* var. *scribnerianum* (Nash) Fern.
Papaw – *Asimina triloba* (L.) Dunal.
Partridge berry – *Mitchella repens* L.
Passion flower – *Passiflora lutea* L.
Pear, prickly – *Opuntia rafinesquii* Engelm.
Pecan – *Carya illinoensis* (Wang.) K. Koch
Pencil-flower – *Stylosanthes biflora* (L.) B.S.P.
Persimmon – *Diospyros virginiana* L.
Pickerel weed – *Pontederia cordata* L.
Pigweed, winged – *Cycloloma atriplicifolium* (Spreng.) Coult.
Pine, Austrian – *Pinus nigra* Arnold
Pine, pitch – *Pinus rigida* Mill.
Pine, Scotch – *Pinus sylvestris* L.
Pine, southern yellow – *Pinus echinata* Mill.
Pine, white – *Pinus strobus* L.
Pitcher plant – *Sarracenia purpurea* L.
Plantain, rattlesnake – *Goodyera pubescens* (Willd.) R. Br.
Plume grass – *Erianthus alopecurioides* (L.) Ell.
Polygala – *Polygala verticillata* L.
P. polygama Walt.
Polypody – *Polypodium polypodioides* (L.) Watt
Polypody, common – *Polypodium vulgare* var. *virginianum* (L.) Eaton
Pond lily, yellow – *Nuphar advena* Ait.
Pondweed – *Potamogeton* spp.
Poverty grass – *Danthonia spicata* (L.) Beauv.
Prairie-dock – *Silphium terebinthinaceum* Jacq.
Primrose, bird's-eye – *Primula mistassinica* Michx.
Primrose-willow – *Jussiaea decurrens* (Walt.) DC.
J. diffusa Forsk.
J. leptocarpa Nutt.
Privet, swamp – *Forestiera acuminata* (Michx.) Poir.
Puccoon – *Lithospermum canescens* (Michx.) Lehm.
Puttyroot – *Aplectrum hyemale* (Muhl.) Torr.
Redbud – *Cercis canadensis* L.
Red cedar – *Juniperus virginiana* L.
Reed, common – *Phragmites communis* Trin.
Reed grass – *Calamagrostis canadensis* (Michx.) Beauv.
Reed grass, canary – *Phalaris arundinacea* L.
Rose, swamp – *Rosa palustris* Marsh.
Rosinweed – *Silphium integrifolium* Michx.
St. John's-wort, marsh – *Triadenum walteri* (Gmel.) Gl.
Sassafras – *Sassafras albidum* (Nutt.) Nees.
Saxifrage – *Saxifraga pensylvanica* L.
Sea-rocket – *Cakile edulenta* (Bigel.) Hook.
Sedge – *Carex* spp.
Sedge, cotton – *Eriophorum virginicum* L.
Seed-box – *Ludwigia alternifolia* L.
Selaginella, rock – *Selaginella rupestris* (L.) Spring
Shadbush – *Amelanchier arborea* (Michx. f.) Fern.
Silver-bell tree – *Halesia carolina* L.
Skullcap – *Scutellaria lateriflora* L.
Smartweed – *Polygonum hydropiperoides* Michx.
Snakeroot, white – *Eupatorium rugosum* Houtt.
Sphagnum – *Sphagnum* spp.
Spicebush – *Lindera benzoin* (L.) Blume
Stickleaf – *Mentzelia oligosperma* Nutt.
Stonecrop, ditch – *Penthorum sedoides* L.
Sumac, fragrant – *Rhus aromatica* Ait.
Sumac, poison – *Rhus vernix* L.
Sumac, smooth – *Rhus glabra* L.
Sumac, winged – *Rhus copallina* L.
Sunflower – *Helianthus* spp.
Switchgrass – *Panicum virgatum* L.
Sycamore – *Platanus occidentalis* L.
Talinum – *Talinum parviflorum* Nutt.
Tamarack – *Larix laricina* (DuRoi) K. Koch
Thistle, Canada – *Cirsium arvense* (L.) Scop.
Thistle, Russian – *Salsola kali* var. *tenuifolia* G.F.W. Meyer
Thistle, swamp – *Cirsium muticum* Michx.
Three-awn grass – *Aristida desmantha* Trin. & Rupr.
A. oligantha Michx.
A. tuberculosa Nutt.
Trumpet creeper – *Campsis radicans* (L.) Seem.
Touch-me-not – *Impatiens biflora* Walt.
Tulip tree – *Liriodendron tulipifera* L.
Tupelo – *Nyssa aquatica* L.
Twayblade – *Liparis liliifolia* (L.) Rich.
Viburnum – *Viburnum* spp.
Violet – *Viola* spp.
Virginia creeper – *Parthenocissus quinquefolia* (L.) Planch.
Walnut, black – *Juglans nigra* L.
Water lily, white – *Nymphaea tuberosa* Paine.
Water-milfoil – *Myriophyllum verticillatum* L.
Waterweed – *Anacharis* spp.
Whitlow's grass – *Draba* spp.
Willow – *Salix* spp.
Willow, black – *Salix nigra* Marsh.
Willow, peach-leaved – *Salix amygdaloides* Anders.
Willow, Virginia – *Itea virginica* L.
Winterberry – *Ilex verticillata* (L.) Gray
Witch hazel – *Hamamelis virginiana* L.
Yew, Canada – *Taxus canadensis* Marsh.